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APIC Practice Guidelines Committee (PGC) Position Statement on Adenosine Triphosphate (ATP) Testing of Reusable Textiles in Healthcare Facilities

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APIC supports the following recommendation from the Centers for Disease Control and Prevention's (CDC) HICPAC "*Guidelines on Environmental Infection Control in Health-care Facilities, 2003:*"

G. Laundry and Bedding

V. Microbiologic Sampling of Textiles

- A. Do not conduct routine microbiological sampling of clean textiles. ¹

In years past, microbiological sampling of the healthcare environment traditionally involved collection of samples from environmental surfaces, air, soils, or water and assaying contamination present therein via environmental microbiological cultures. More recently, however, an advanced technology that measures the presence of adenosine triphosphate (ATP) in organic matter from a range of sources that includes living microbes, soil bioburden, and natural materials is used increasingly to detect residual contamination on hard, non-porous surfaces in the indoor environment. ² The detection of ATP in bioburden is made possible in an enzymatic reaction, resulting in bioluminescence. This luminescence is expressed in "relative light units" (RLU), providing a quantitative measurement. ATP bioluminescence detection, however, is non-specific (i.e., RLU results cannot distinguish among bacteria, fungi, or viruses or for that matter any other intracellular source of ATP, such as food or soil residual remaining on a surface). Nevertheless, this sampling method is increasingly employed by Environmental Services (ES) professionals to monitor the efficacy of environmental cleaning and disinfection procedures. This method, in conjunction with other cleaning/disinfection assessment methods such as fluorescent marker detection, visual observation, concise checklist documentation, and analysis of objective data from healthcare studies enables a hospital to improve its adherence to the Association for Healthcare Environment (AHE) Practice Guidance and institutional procedures for hard surface cleaning and disinfection. ATP testing has been used extensively in the food industry as part of a broad system to ensure food safety, (i.e., the Hazard Analysis and Critical Control Points [HACCP] assessment). Despite this experience, there remains potential for misinterpretation of test readings. ³

Recently, however, there has been some interest in extending use of the ATP-detection technology to porous materials, such as reusable textiles. The assumption for using ATP-detection technology on healthcare textiles (e.g., sheets, gowns, towels, etc.) is reportedly to confirm the absence of bioburden on the textiles after laundering. This type of application is an inappropriate use of the technology for several reasons.

1. This sampling technology is not currently designated for use on porous surfaces; manufacturers have designated that its use be limited to non-porous surface sampling or use in fluids.



2. There is concern that false elevated RLU values when sampling natural fibers will confound accurate interpretation of the results.⁴
3. To date there have been no efforts on the part of the various manufacturers to achieve standardization of the ATP technology and its RLU readings for use within healthcare, thereby making cross-comparisons of RLU readings and benchmark values problematic.⁵
4. Fourth, and most importantly, there have been no laboratory-based or in-use studies to define the use of such technology for end product testing of the laundering process for reusable textiles. There is currently no evidence to support its use in this service arena.

From an epidemiological perspective, hygienically clean healthcare textiles carry a negligible risk of infection to patients and healthcare personnel (HCP). Hygienically clean is narrowly defined as the absence of bioburden such that the textiles are safe for next patient use. With the lack of documented outbreaks identifying clean and properly stored healthcare textiles as the source/reservoir of contamination, there is no apparent justification for employing the ATP-detection technology (or any other environmental sampling method) to sample hygienically clean healthcare textiles. Therefore, Infection Preventionists who request, require, or perform end product sampling of hygienically-clean healthcare textiles as part of a process improvement monitoring program or for some other non-cluster assessment purpose should be aware that this action is unnecessary. Without epidemiologic evidence and laboratory support, there is no reliable context with which to interpret the results and develop an intervention plan.

The use of a defined laundering process, the parameters of which are established in the industry, is essential for the production of hygienically-clean textiles. This goal for healthcare laundry is achieved by consistent parametric monitoring of the entire laundering process, coupled with best practices in infection prevention for laundry personnel and a well-designed, properly functioning laundry facility in accordance with the Healthcare Laundry Accreditation Council (HLAC) *Accreditation Standards for Processing Reusable Textiles for Use in Healthcare Facilities*.⁶

APIC believes the use of ATP detection technology for determining the cleanliness of hygienically clean, reusable healthcare textiles is inappropriate and unwarranted when the HLAC Standards are employed to ensure the consistent and reliable laundering of these cloth items.

References:

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2 Malik RE, Cooper RA, Griffith CJ. Use of audit tools to evaluate the efficacy of cleaning systems in hospitals. *Am J Infect Control* 2003;31:181-7.

3 Shama G, Malik DJ. The uses and abuses of rapid bioluminescence-based ATP assays. *Int J Hyg Environ Health*. 2012 Apr 25. [Epub ahead of print]



4 Brown E, Eder AR, Thompson KM. Do surface and cleaning chemistries interfere with ATP measurement systems for monitoring patient room hygiene? *J Hosp Infect* 2010;74:193-195.

5 Mulvey D, Redding P, Robertson C, Woodall C, Kingsmore P, Bedwell D. Finding a benchmark for monitoring hospital cleanliness. *J Hosp Infect* 2011;77:25-30.

6 Healthcare Laundry Accreditation Council (HLAC). *Accreditation Standards for Processing Reusable Textiles for Use in Healthcare Facilities, 2011*. Available at: <http://www.hlacnet.org>

